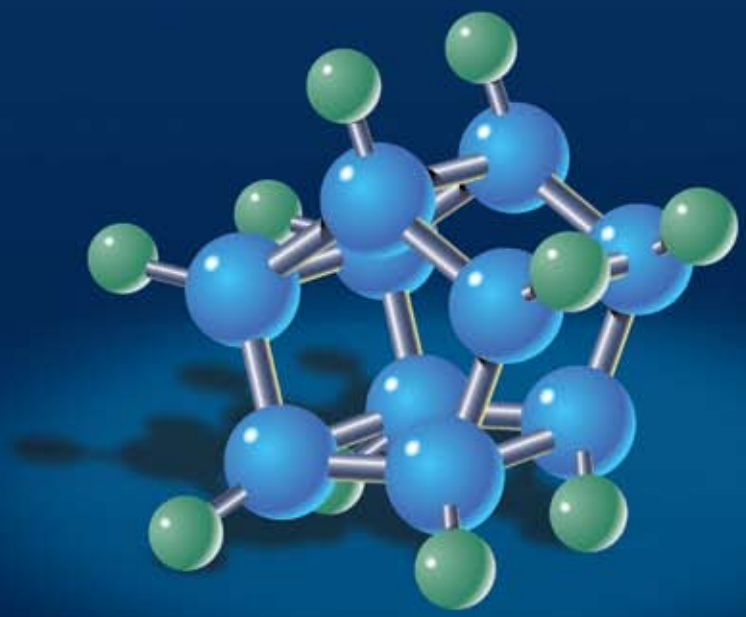
2008, Vol. 2.0

ChemGenes CORPORATION

Experience Nucleic Acid Expertise

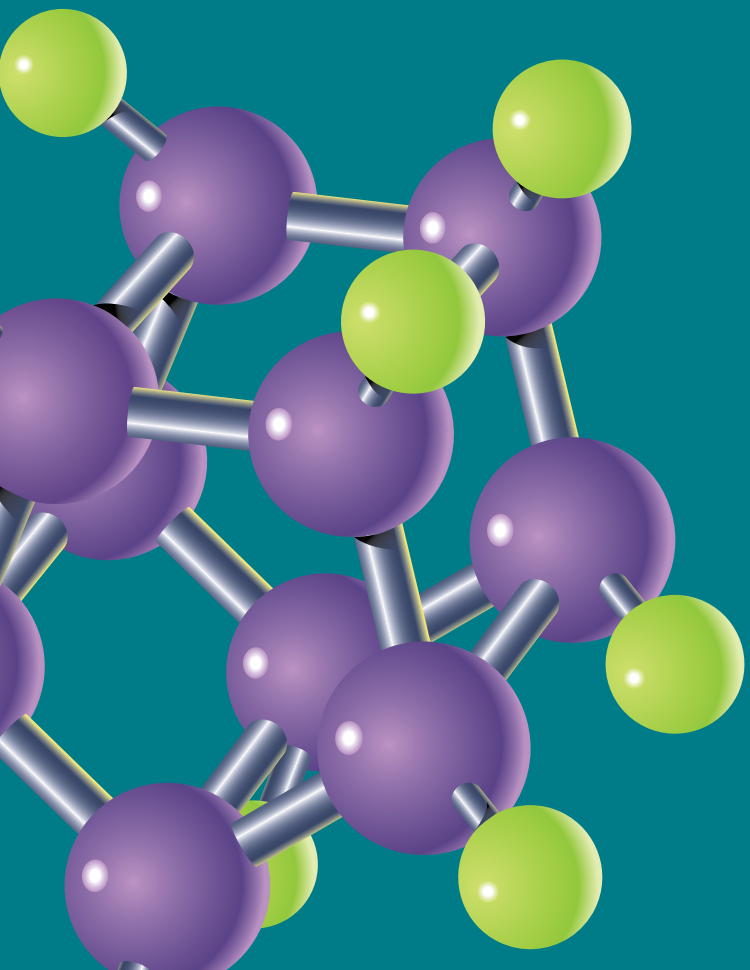


ChemGenes has been in business for over 25 years and has recently moved into a state of the art facility in Wilmington, MA. ChemGenes has a full scale modernized lab with the facilities to manufacture in bulk while maintaining its high quality. We have added many new products to our original line to facilitate research in the area of biotechnology.

As the market for oligonucleotides continues to grow, ChemGenes remains committed to introducing novel products, while maintaining its existing product mix. We also have the capacity to custom synthesize products on request.

Our quality is guaranteed! We want to assure you that every product is of the highest purity and conforms to the technical data sheet that accompanies it when shipped.

- ChemGenes takes pride in a long history of customer satisfaction in supplying phosphoramidites that have a purity of 98% or better for most phosphoramidites.
- Each lot of Phosphoramidite must pass an established testing criteria before it can be shipped to customers.



Required QC Tests for Most Phosphoramidites

Solubility test

- Amidites completely dissolve in Acetonitrile to make a 0.1M Solution (water<0.004-0.005gm/100ml). Leave no visible particulate matter.

Coupling Efficiency

- The coupling efficiency of ChemGenes phosphoramidite products are 98% or better.

HPLC

- Greater then 98.5% purity by HPLC.

31P NMR

- Doublet peak or single peak.
- Position of each peak is know for each phosphoramidite.
- The value between the peaks is calculated and recorded.

UV – The UV test provides 4 values of data:

- The ratio between 250/260 nm.
- The ratio between 260/280 nm.
- Emax position.
- Extinction Coefficient.

MASS Spectrum

- Performed on each product in +ve and -ve mode.

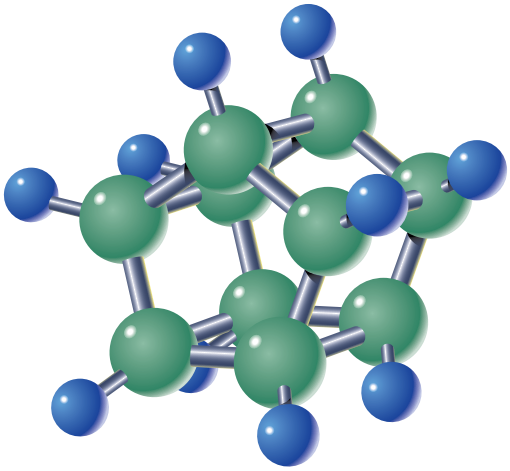
1H NMR

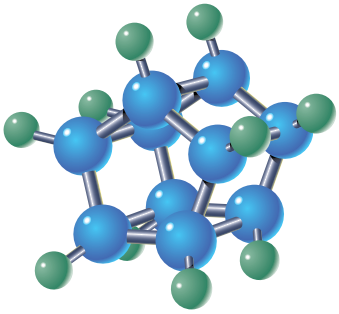
- Proton NMR analysis is performed for each product.

TLC

- Single or double spot with no other visibly impurity on spotting, 0.2mg/spot.
- Single spot or double spot depends on the phosphoramidite.

ChemGenes CORPORATION





Our Products

Oligo Synthesis Reagents

Natural DNA Amidites & Supports

Ancillary Reagents

Modified DNA Amidites & Supports

Natural RNA Amidites & Supports

Amidites and Supports for Introducing Chromophores & Ligands

Amidites and Supports for 2′-O-Methyl Oligonucleotides

Drying Traps

Oligonucleotide Purification

Nucleosides, Sugars, Purines, & NHS Esters

Unprotected mononucleosides

N-protected mononucleosides

DMT-protected mononucleosides

Phosphoramidite Chemistry Reagents

Sugars & Purines

NHS-Esters

Trisphosphates

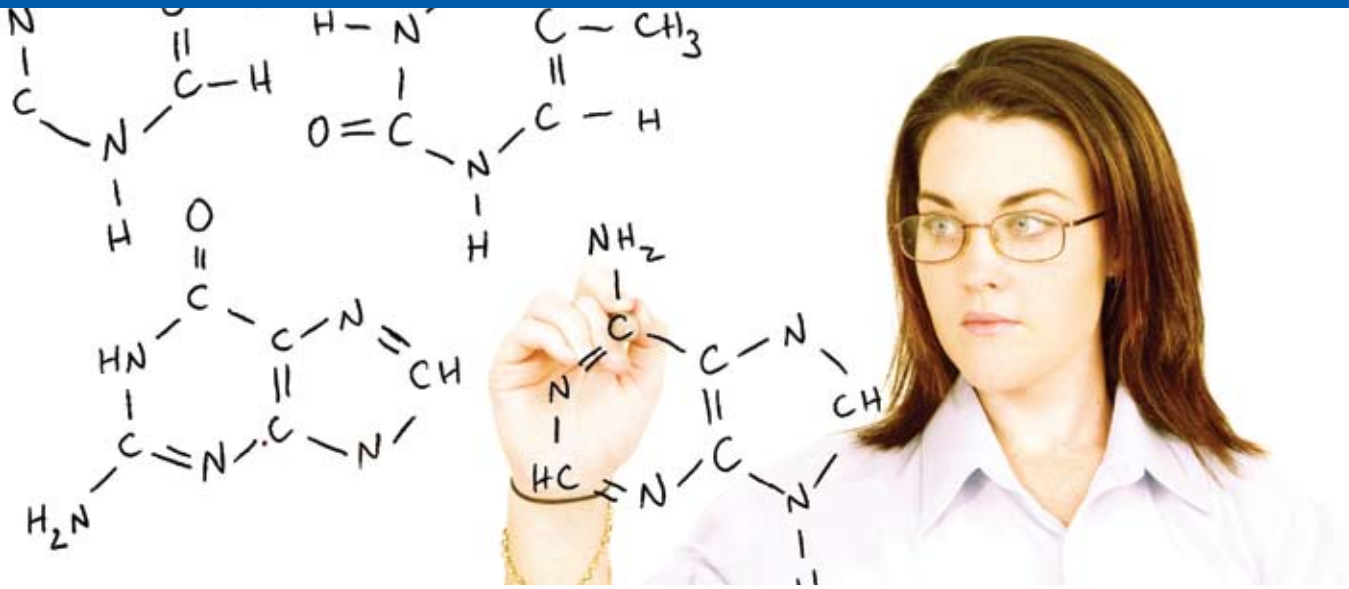
Modified Triphosphates

Custom Synthesis

New Featured Products

Universal Support
TOM Amidites
8-Methyl ribo Guanosine Amidite
8-Methyl deoxy Guanosine Amidite
Reverse RNA Synthesis
5′-O-Methyl DNA Amidite

TOM Phosphoramidites

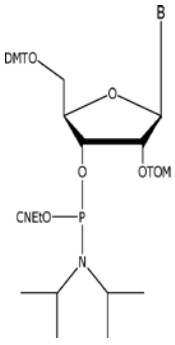


Key Advantages:

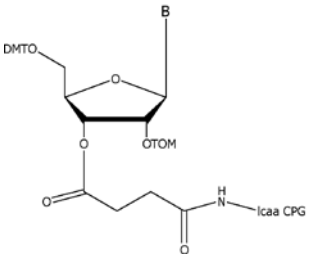
- **Superior Quality RNA** using 2′-O-TOM protection: No possibility of 2′-5′-linkage
- Perfected manufacturing process: **prices comparable to TBDMS**
- **Higher Coupling Efficiency** due to lower steric hindrance: Reduced Coupling Time (2-4 minutes)
- **No base modification or M + 30 observed** (extensive chemical Ionization mass analysis)

Quality Guaranteed:

- Purity greater than 97% by HPLC.
- 31 P NMR purity ranges from 98 -100%
- UV Spectral data to conform to highest
- 1 H NMR data to conform
- Coupling efficiency greater than 98% per step
- Ideal for Long Chain Oligos
- TOM Amidites Produced under GMP guidelines



B	Protection	Catalog #
A	n-acetyl	**ANP-3201**
C	n-acetyl	**ANP-3202**
G	n-acetyl	**ANP-3203**
U	n/a	**ANP-3205**



B	Protection	Catalog #	Pore Size
A	n-acetyl	**N-32001-05**	500A
		N-32001-10	100AA
C	n-acetyl	**N-32002-05**	500A
		N-32002-10	1000A
G	n-acetyl	**N-32003-05**	500A
		N-32002-10	1000A
U	n/a	**N-32005-05**	500A
		N-32005-10	1000A

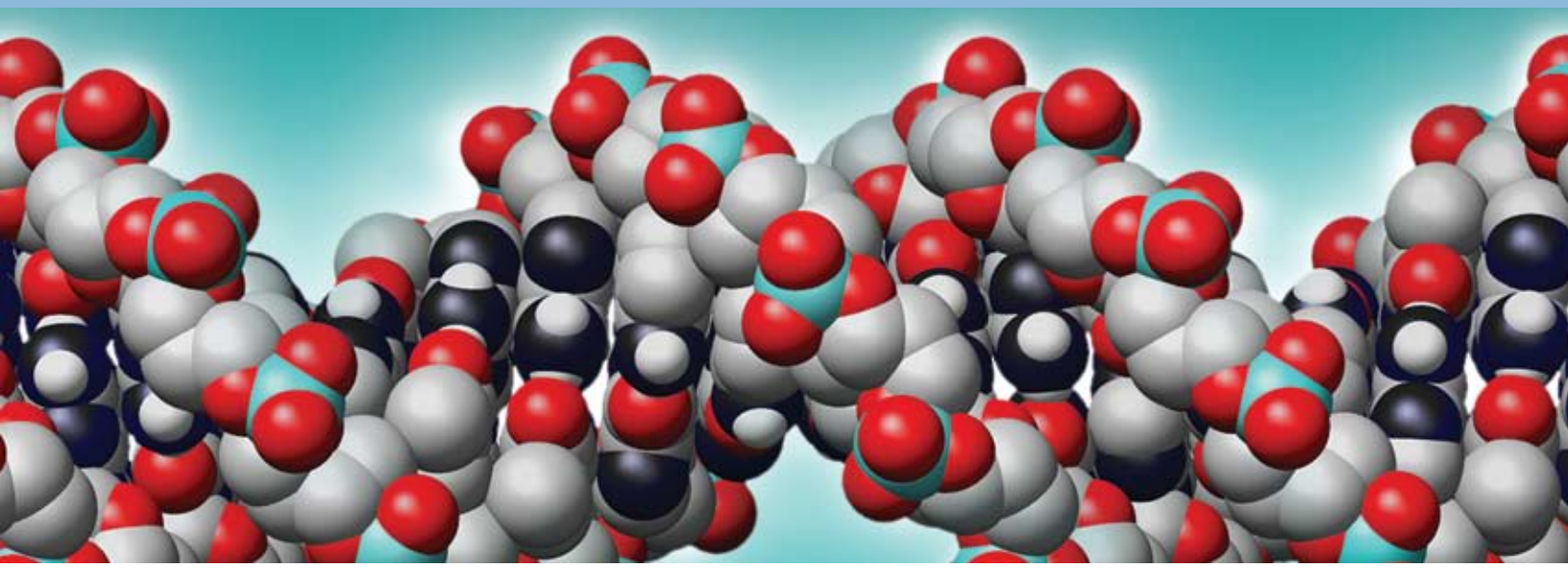
Also Available:

Low to high loading CPG supports with TOM-monomer for uniform deprotection of RNA's.

Now Available Bulk Quantities Manufactured Under GMP Guidelines

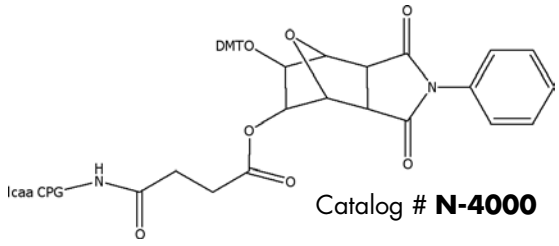
ChemGenes CORPORATION

Universal and Non-Cleavable Supports



UnyLinker Universal Support for Synthesis of Oligonucleotides:

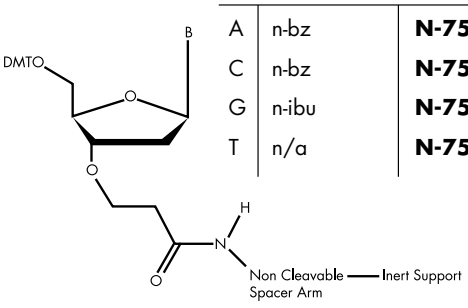
- Technology Licensed from Isis Pharmaceuticles
- CPG and Polystyrene supports
- Bulk supports and pre-packed columns Available



Catalog # **N-4000**

Non Cleavable Supports & Columns:

- Non- Cleavable inert Supports & Columns
- Uniform Particle Size
- Long Chain Spacer on Rigid non-swellable Support
- Two particle sizes are available; 15-20 um & 60-70 um



B	Protection	Catalog #	Pore Size
A	n-bz	**N-7521**	**300A**
C	n-bz	**N-7522**	**300A**
G	n-ibu	**N-7523**	**300A**
T	n/a	**N-7524**	**300A**

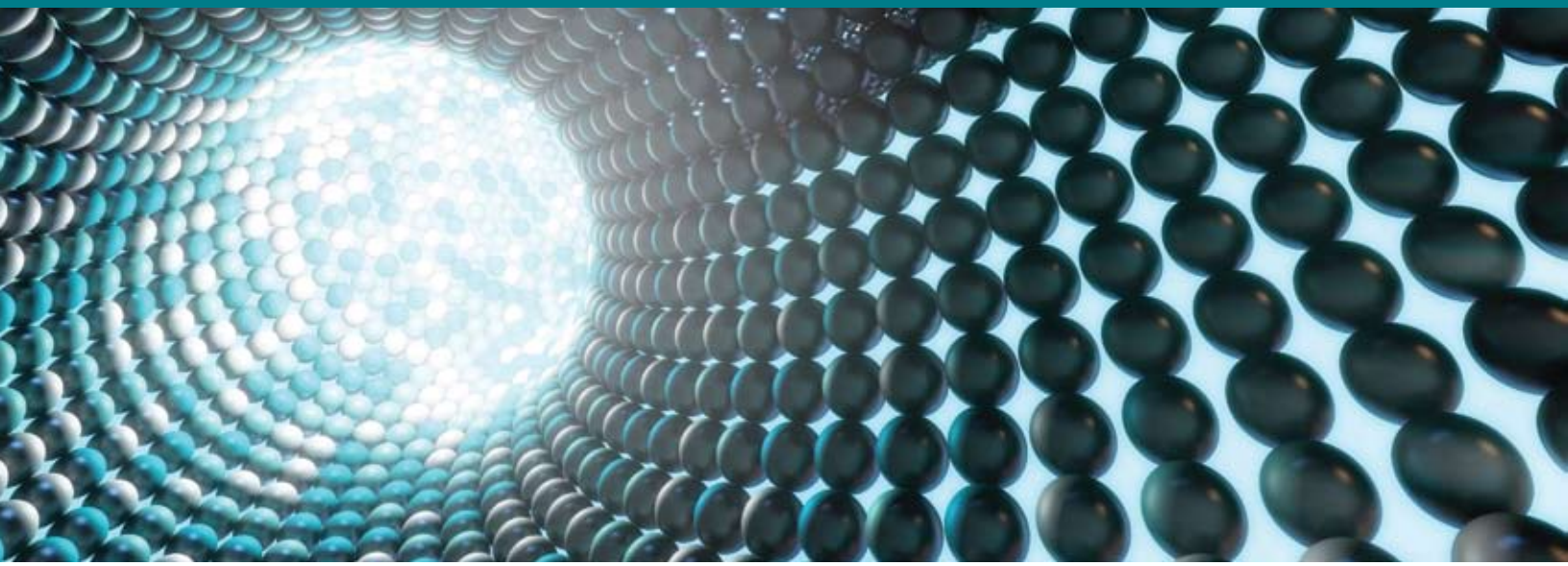
Key Features:

- Fully compatible with standard phosphoramidite reagents and synthesis conditions
- Has standard DMT group and requires standard deblock solutions for oligonucleotides synthesis
- Coupling efficiency greater than or equal to 99%
- Results in 3' – OH oligonucleotides
- Clean standard succinate linkage and so cleavage from support is quantitative during ammonia incubation

Key Applications:

- Affinity based chromatography for oligonucleotides, proteins, and other macromolecule.
- Design and construction of one bead one compound libraries by split synthesis method.
- For Combinatorial Libraries
- PCR amplification is possible with the support attached to oligonucleotides.
- Oligo Synthesis on bead bound oligonucleotides, have performed beyond expectations, Coupling greater than or equal to 98% - 99% per step.

7-Deaza Products



ChemGenes has perfected the technology of productions of these modified bases and the corresponding phosphoramidites

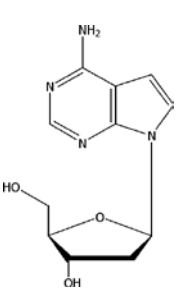
These modifications find extensive application in the design and selection introduction of these modified bases into DNA. Some of the key properties of the 7-deaza modification are outlined:

- Avoids the problem of extensive secondary structure formation, and thereby improves the targeted hybridization.
- Antiparallel triple helix formation with double stranded DNA is favored with this modification.
- The nucleoside and corresponding triphosphates are currently used in DNA sequencing analysis.

ChemGenes has extensive capabilities in the following

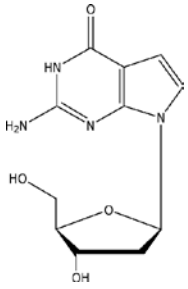
- Bulk quantities of the 7-deaza-2′-deoxy nucleosides for DNA sequencing and molecular biology studies.
- Highest purity 7-deaza-2′-deoxy nucleoside phosphoramidites for specific introduction of these modified bases into synthetic DNA sequences.

ChemGenes currently has available the nucleosides; 7-Deaza-r-adenosine, 7-deaza-r-guanosine and 7-deaza-r-inosine, as well as the corresponding 2′-tBDSilyl phosphoramidites.



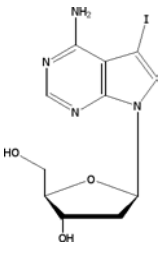
7-Deaza deoxy Adenosine

Catalog #
DN-1143



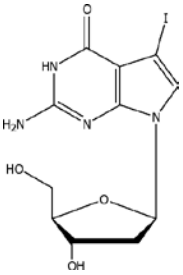
7-Deaza deoxy Guanosine

Catalog #
DN-4567



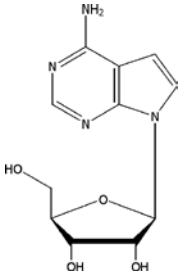
7-Deaza-7-Iodo deoxy Adenosine

Catalog #
DN-2561



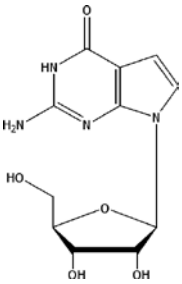
7-Deaza-7-Iodo deoxy Guanosine

Catalog #
DN-2563



7-Deaza ribo Adenosine

Catalog #
RP-2312

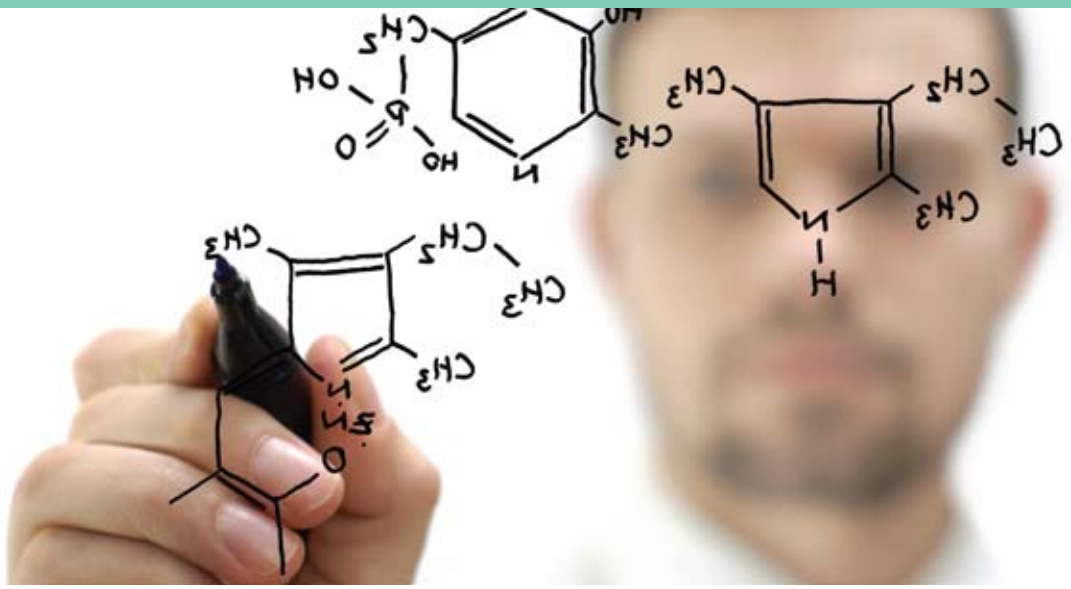


7-Deaza ribo Guanosine

Catalog #
RP-2313

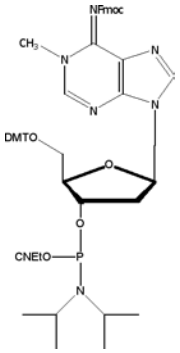
ChemGenes CORPORATION

N-Alkylated Phosphoramidites



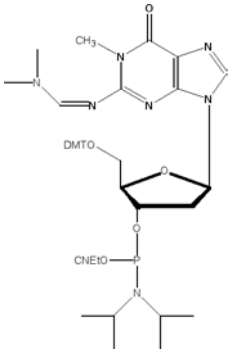
- ChemGenes offers the phosphoramidites for studies and possibilities of reversal of methylated lesions by use of oligonucleotides incorporation alkylated purine/pyrimidine.
- Due to mutagenic effects of carcinogens, DNA in living organisms is vulnerable to alkylation.
- It has been shown that there is a direct reversal of n-alkylation of methylated bases in oligonucleotides.
- The discovery of an enzyme which is substrate for DNA repair has great implications for repair of such carcinogenic and mutagenic effects.

Our featured products include:



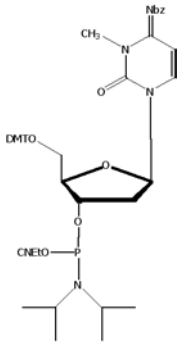
N1-Methyl deoxy Adenosine Phosphoramidite

Catalog # **ANP-6121**



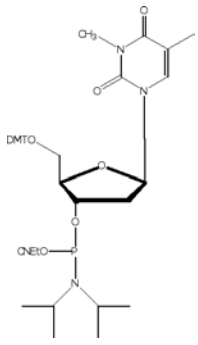
N1-Methyl deoxy Guanosine Phosphoramidite

Catalog # **ANP-6122**



N3-Methyl deoxy Cytidine Phosphoramidite

Catalog # **ANP-3851**

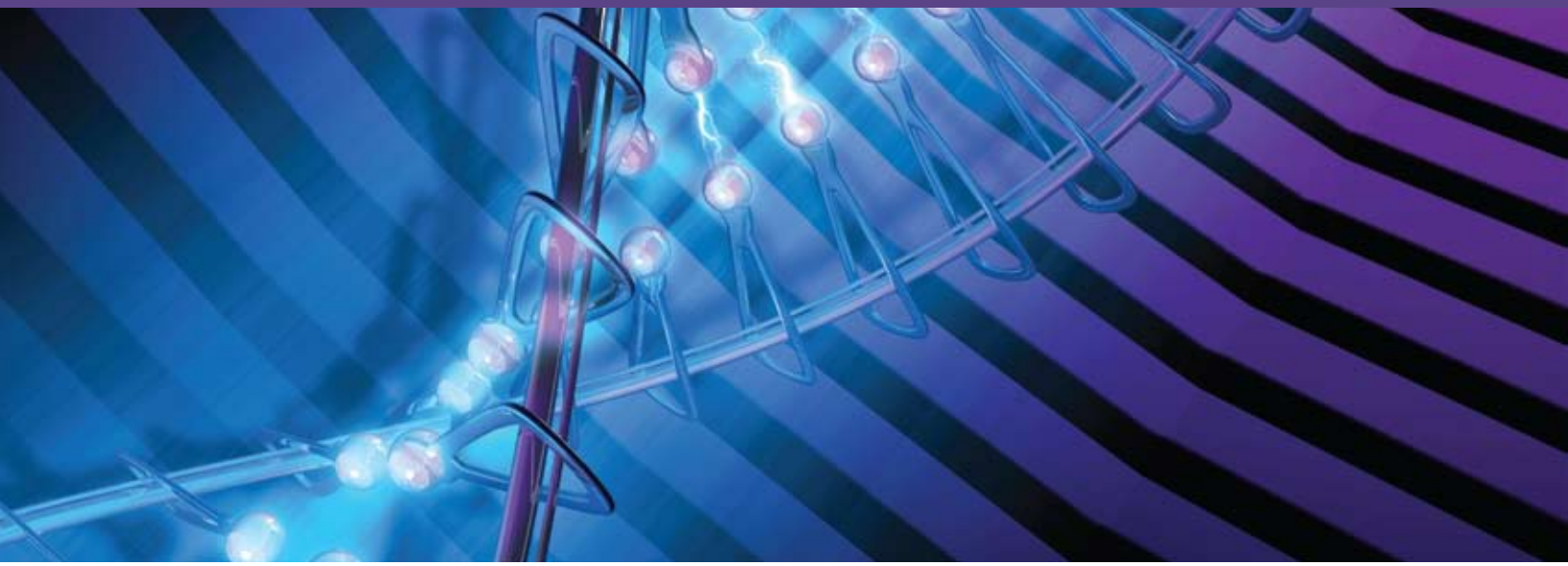


N3-Methyl Thymidine Phosphoramidite

Catalog # **ANP-6153**

(S.C. Trewick, T.F. Henshaw, R.P.Hausinger, T. Lindahl and B. Sedgwick, Nature, 419, 174-177, 2002; and another report confirming these observations, P.Falnes, R.F. Johansen, E. Seeberg, Nature 419, 178, 2002).

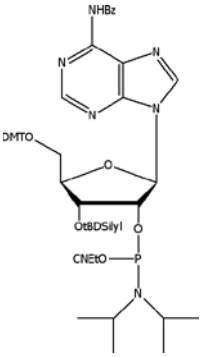
3′-tBDSilyl RNA Phosphoramidites



- Allows the synthesis of 2′-5′-linked oligos.
- RNA 2′,5′-duplexes are not substrates of the enzyme RNAse. However, they can inhibit the RNaseH mediated cleavage of a natural DNA: RNA substrate.

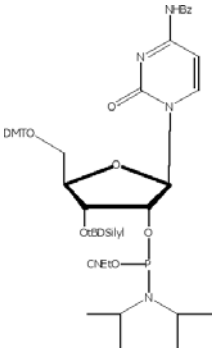
Useful Applications

- Determine their exact biological role.
- Extend their biological half life.
- Alter the biological activity of the core structure.



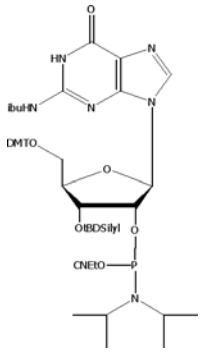
Adenosine (n-bz) 3′-tBDSilyl CED OP

Catalog #
ANP-5681



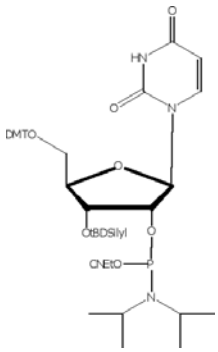
Cytidine (n-bz) 3′-tBDSilyl CED OP

Catalog #
ANP-5682



Guanosine (n-ibu) 3′-tBDSilyl CED OP

Catalog #
ANP-5683



Uridine 3′-tBDSilyl CED OP

Catalog #
ANP-5684

ChemGenes CORPORATION

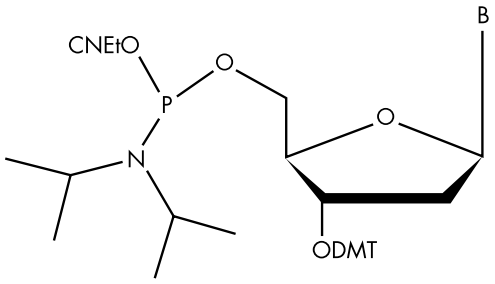
Reverse DNA and RNA Oligo Synthesis

- ChemGenes offers reverse amidites with 5′, 3′-direction of synthesis.
- Including reverse 2′-O-Methyl amidites, Reverse Abasic Amidite, Reverse deoxy Amidites, and more…

Reverse DNA Oligo Synthesis:

- Synthesis of 3′-3′-linked DNA.
- Synthesis of special oligonucleotides required to be coupled at the 5′-end selectively.
- Synthesis of oligonucleotides from left to right (5′-3′-direction).

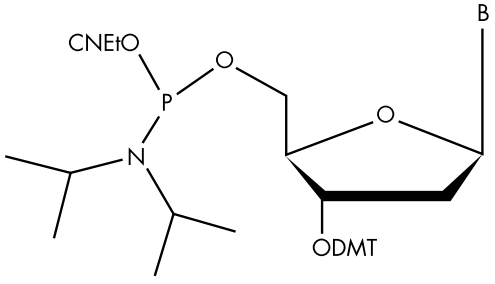
B	Protection	Catalog #
A	n-bz	**ANP-4671**
C	n-bz	**ANP-4672**
G	n-ibu	**ANP-4673**
U	n/a	**ANP-4674**



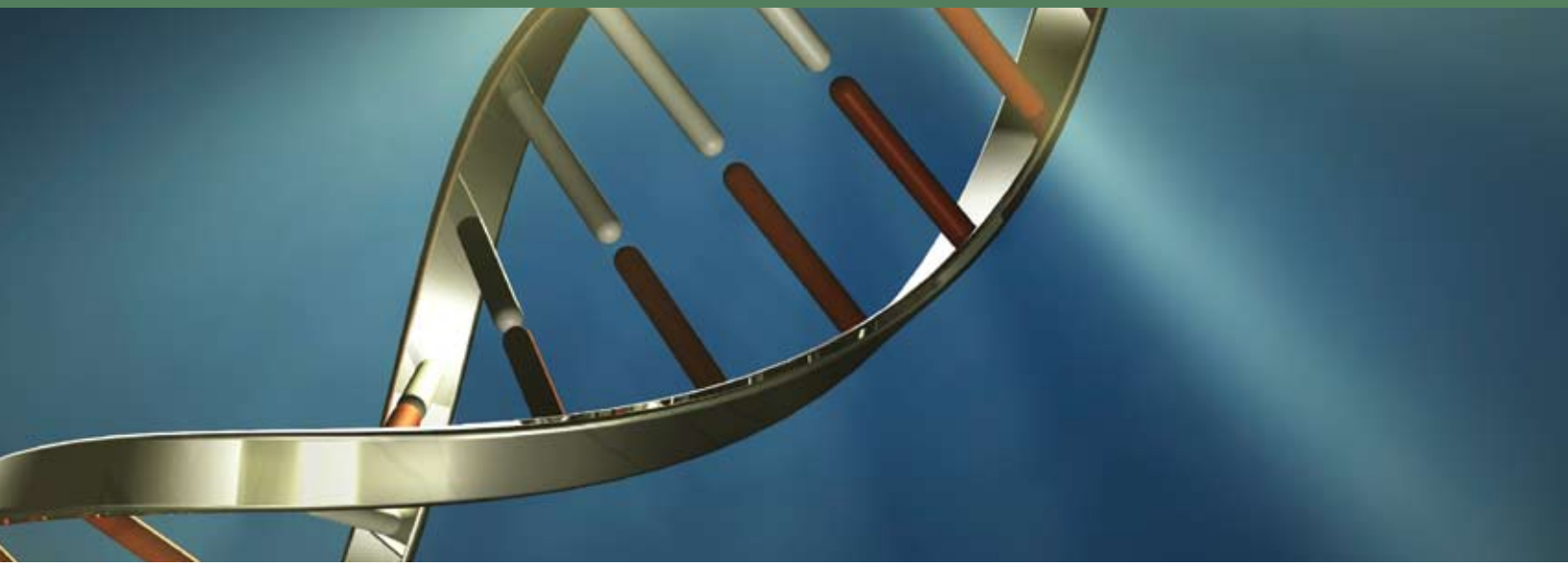
Reverse RNA Oligo Synthesis:

- For efficient synthesis of Long Chain Oligos
- For efficient RNA synthesis with Ligand or Chromophore attachment at 3′-end of RNA.
- Also available are reverse 2′-O-Methyl RNA

B	Protection	Catalog #
A	n-bz	**ANP-1012**
C	n-bz	**ANP-1013**
G	n-ibu	**ANP-1014**
U	n/a	**ANP-1015**



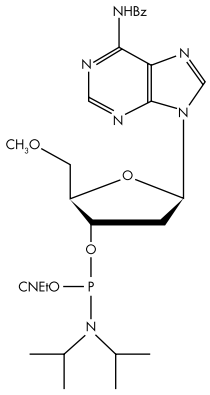
5′-O-Methyl DNA Phosphoramidites



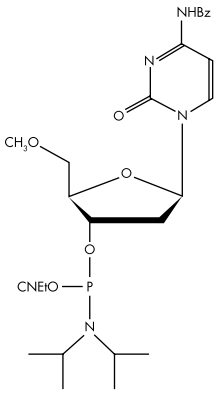
- Chain Terminators for Synthetic DNA using all four amidites.
- All four 5′-O-Methyl-2′-deoxy A,C,G and T-3′-amidites are available for oligo synthesis and incorporating at the 5′-end of oligo.

Quality Control

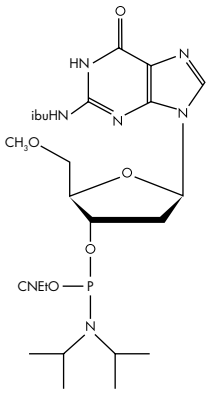
- HPLC purity greater than 98%
- 31 P NMR purity greater than 98%
- Coupling efficiency greater than 98%



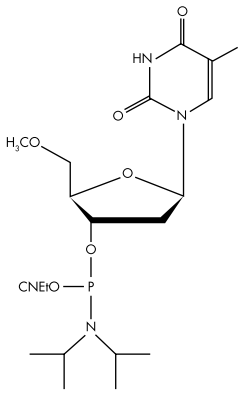
5′-O-Methyl-Adenosine (n-bz)
CED OP
Catalog #:
ANP-5511



5′-O-Methyl-Cytidine (n-bz)
CED OP
Catalog #:
ANP-5512



5′-O-Methyl-Guanosine (n-ibu)
CED OP
Catalog #:
ANP-5513



5′-O-Methyl Thymidine
CED OP
Catalog #:
ANP-5514

ChemGenes CORPORATION

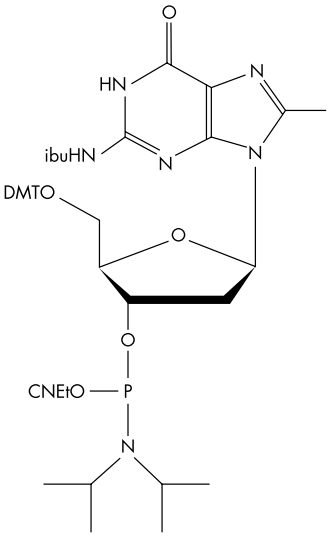
8-Methyl Guanosine Phosphoramidites

8-Methyl-2′-dGuanosine & 8-Methyl-rGuanosine:

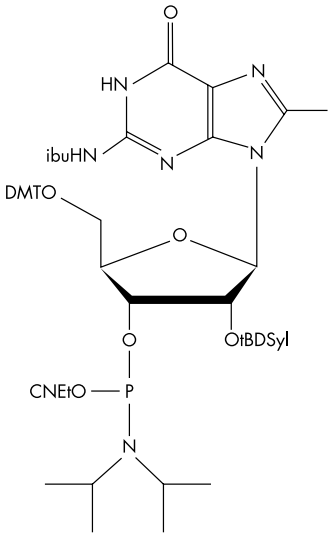
- Powerful Z–DNA stabilizer
- Readily Effects B & Z–DNA transformation
- When incorporated into appropriate positions of synthetic DNA

Applications:

- For study of functional role in Gene Expression, transcription control etc.
- Selectivity of Z DNA in protein interactions
- DNA supercoiling modulation
- Selective Targeting of proteins or enzymes
- Aptamer Design and Therapeutic development



8-Methyl deoxy Guanosine
CED OP
Catalog #:
ANP-9274



8-Methyl ribo Guanosine
CED OP
Catalog #:
ANP-6274

ChemGenes CORPORATION

33 Industrial Way
Wilmington, MA 01887 USA

Tel: 978-694-4500
Fax: 978-694-4502
Toll Free: 800-762-9323
Email: info@chemgenes.com

www.chemgenes.com